# CHECKSHEET FOR INITIALS ASSIGNMENT (HW6)

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NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ SECTION #: \_\_\_\_\_

**Part A. Pre-CAD Plan** *(submit doc/docx AND pdf for preliminary grading on Day 7)*

\_\_ Ordered list of feature creation steps

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\_\_ Indicate sketch plane and position/orientation of origin (show consistent xyz coordinate system in all sketches)

\_\_ Identification/depiction of basic 2D shapes (2 pts)

Deductions on 6A

\_\_\_ Missing/incorrect checksheet (*-1*)

\_\_\_ Not a doc/docx file (*-1*)

\_\_\_ Incorrect filename (*-1*)

Use: *HW6A\_firstname\_lastname*

\_\_ Identification of key dimensions (attempting to minimize these)

\_\_ Identification of key supporting relations (use SolidWorks icons) (2 pts)

\_\_ Depictions of how/where you will use reference geometry

**Above and Beyond (Exemplary)**

\_\_ Exceptional organization and neatness

\_\_ List/description of assumptions and potential roadblocks

\_\_Other:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Part B. Process Documentation**

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\_\_ Appropriate use of curvature (not splines) and angled (not just horizontal/vertical) geometry in 2D sketches

\_\_ Clear visualization of relations (2 pts)

Deductions on 6B and 6C

\_\_\_ Not graded cover page

from 6A submission (*-2*)

\_\_\_ Not a .doc/.docx (*-2*)

\_\_\_ Incorrect filename (*-2*)

Use: *HW6\_firstname\_lastname*

\_\_ Use of reference geometry (plane, axis, point, or coordinate system)

\_\_ Details/rationale on implementation of reference geometry and sketch relations (use good technical writing skills)

\_\_ Annotated design tree

\_\_ Completed part properties custom tab

\_\_ Compelling lessons learned

**Above and Beyond (Exemplary)**

\_\_ Exceptional organization with clear and concise text throughout (avoid

narration, justification, first-person, subjective, and superfluous text)

\_\_ Sketches appear to be “powerful” (through use of relations to minimize number of dimensions)

\_\_ Other:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Part C. Products** (based on finished model and drawing)

\_\_ Fully-defined sketches (2 pts)

HW6 Extra Credit (submitted by Day 15)

\_\_\_ Image of model in slicer software (w/ print volume and time) (*+1*)

\_\_\_ Image of finished 3D-printed model (print time limits: <2hr on Sindoh, <30min on Bambu Lab printers) (*+1*)

\_\_\_ 2 lessons learned from the 3D printing process (*+1*)

Deduction: \_\_\_ Missing graded HW6 checksheet (*-0.5*)

\_\_ Sufficiently complex solid model (2 pts)

\_\_ Enhancements to appearance of solid model

\_\_ Use of ME drawing template

\_\_ Multiple, non-redundant views in 3rd Angle orientation

\_\_ 6 general dimensions (size/position of letters)

**Above and Beyond (Exemplary)**

\_\_ Exceptional organization and neatness

\_\_ Creative/complex design

\_\_ Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**ME 301 INITIALS ASSIGNMENT**

**PURPOSE**: 1) Gain experience with constraining non-straight-line sketch geometry. 2) Practice making ‘powerful’ sketches that can be easily resized by editing only a few dimensions.

**INSTRUCTIONS**: Draw your initials with a custom-designed font using minimum dimensions and maximum relations. Your initials should be made in 3 separate ‘powerful’ sketches that can be easily rescaled. Properly use the origin and define your sketch without using "fix". Next, make your initials "cool and 3D" using feature tools like extrude, shell, fillet, chamfer, wrap etc.  Add personal touches like shading, texture, color, etc. Finally print your design on a 3D printer.

Turn in the following **Pre-CAD plan**:

Initial and/or simplifying assumptions; bulleted list of feature creation steps; 2-D hand drawings of each initial with construction lines, basic shapes, origin position/orientation, location of basic dimensions, and planned use of key sketch relations to create fully defined sketches; list of potential challenges.

Turn in the following **Process Documentation**:

Design journal (including sketches with relations and dimensions, discussion of your use of sketch tools, development of your extruded final product, annotated design tree, completed part file properties summary and custom tabs, and at least three lessons learned through the assignment). Capture and comment on your work at intermediate stages of development. **Note:** completed part properties for this assignment should include Author in the *Summary* tab, and Quantity, PartNo, Material, and Description in the *Custom* tab.

Turn in the following **Final** **Products**:

Fully-defined sketch(es) of your initials before extrusion.

Solid model showing details of your finished product in the display window. Use color screenshots in your word doc for a more impactful presentation.

Engineering drawing of your finished product (including shaded isometric view, non-redundant orthographic views, part properties, necessary and non-redundant dimensional annotations). Use the ME drawing template (3rd angle orientation and data exchanged between the part and drawing using part property information).

Optional **Extra Credit:**

Images of 3D printed part of your initials design using one of the available ME301 filaments in the PrintWorks Studio (GJ 234 F).

Screenshot of the slicer showing print volume and print time. Include a picture of your final printed part with brief descriptive caption.

2 lessons learned from the printing process (what worked/why, what didn’t work/why not, what would you change if you printed it again?).

**SUBMISSION SCHEDULE/INSTRUCTIONS:**

|  |  |  |
| --- | --- | --- |
| **Day** | **Files to Submit** | **Submission Instructions** |
| 7 | Part A (.pdf AND .doc/.docx)   1. PDF (**no** checksheet needed)   **AND**   1. DOC (**with** checksheet) | * + PDF: use Adobe scan (or similar) to scan your Pre-CAD plan.   + DOC/DOCX: Take a screen snip (Snip & Sketch tool in Windows) of your scan and paste it into this Word document under section “*Pre-CAD Plan (1st Submission)”.*   + Those that receive <7/10 can resubmit for up to 8/10 at final submission   + Those that receive >=7/10 can resubmit for up to 10/10 at final submission |
| 9 | Parts A-C (*.doc/.docx*)   1. Part A – 1st submission 2. Part A – 2nd submission (if needed 3. Part B 4. Part C | * If you made changes to your Pre-CAD plan, re-scan, snip, and paste it into the Word document under section “*Pre-CAD Plan (2nd Submission)*”. * If you are not re-submitting your pre-CAD for more points, simply remove the 2nd submission section. * In either case, include your 1st submission of Part A in the final submission. |
| 9-15 | Extra Credit | * DOC/DOCX: titled “*HW6 Extra Credit\_firstname lastname*” |

# Pre-CAD Plan (1st Submission)

**Initial Assumptions:**

**Bulleted Feature Creation Steps (Ex: 1. Top plane Extrude Boss; 2. Right plane Revolve Cut; 3. Face Chamfer; 4. Pattern; 5. Mirror about new Plane 1):**



**More Details on Primary Features**

**From Step (#):  *\_\_\_\_\_\_***

Sketch Plane: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3D Feature type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Key Feature Details (dimensions/end conditions):

2D Sketch(es) from 1st primary feature

**From Step (#): *\_\_\_\_\_\_***

Sketch Plane: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3D Feature type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Key Feature Details (dimensions/end conditions):

2D Sketch(es) from 2nd primary feature

**From Step (#):  *\_\_\_\_\_\_***

Sketch Plane: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3D Feature type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Key Feature Details (dimensions/end conditions):

2D Sketch(es) from 3rd primary feature

**Potential Challenges:**

# Pre-CAD Plan (2nd Submission)

# Process Documentation

## Appropriate use of curvature/angled geometry and clear visualization of relations in 2D sketches

## Use of reference geometry (plane, axis, point, or coordinate system)

Deductions on 6B and 6C

\_\_\_ Not graded cover page

from 6A submission (*-2*)

\_\_\_ Not a .doc/.docx (*-2*)

\_\_\_ Incorrect filename (*-2*)

Use: *HW6\_firstname\_lastname*

## Details/rationale on implementation of SW 3D features

## Annotated design tree

## Completed part properties custom tab

## Compelling lessons learned

# Final Products

## Fully-defined sketches (if not visible from annotated design tree above)

## Screenshots that illustrate model complexity and enhancements to appearance

## Dimensioned drawing using ME template, multiple, non-redundant views in 3rd Angle orientation, and 6 general dimensions (size/position of letters)